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Potential and Challenges of Digital Governance at the Local Level in Central Sulawesi, Indonesia

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Abstract

Many countries, as well as several regions in Indonesia, are adopting digital government with the urgency that this approach is helpful as a bridge to good governance. However, more examination is needed to see both the opportunities and obstacles of digital government by assessing cases at the local level. This research analyses the potential and challenges of developing digital government locally with a case study in Central Sulawesi Province. The region was selected for analysis because Central Sulawesi has developed the necessary telecommunications infrastructure and internet access. The study relies on online research methods to collect data and information via the internet and other digital technology. This study employs NVivo 12 Plus for analysis. The findings of this research reveal that Central Sulawesi has great potential in developing digital government, such as optimising data management, accelerating administrative processes and increasing citizen involvement. However, the study also identifies challenges, such as poor access to digital infrastructure in rural areas and limited digital skills among government employees. Therefore, strong efforts are needed to expand the reach of internet access, improve digital skills and increase citizen participation in the development of digital government. This research provides an in-depth understanding of the potential and challenges of developing digital government in Central Sulawesi as well as relevant policy recommendations to increase digital adaptation at the local level.

Introduction

Digital government is urgently needed in today's modern society (Larsson, 2021; Malodia et al., 2021). Information and communication technology advances have changed how people interact, work and access information (Amosun et al., 2022; Olanrewaju et al., 2020). A digital government utilises this technology to provide more efficient, transparent and responsive public services. Digital government allows the government to provide public services online, making it easier for people to access government services anytime and anywhere. For example, people can apply for business permits, take care of population administration or pay taxes through the digital government portal. This remote access reduces the bureaucracy, time and costs involved in the process (Dobrolyubova et al., 2019; Mergel, 2019; Reggi & Gil-Garcia, 2021; Styrin et al., 2022).

Digital government has been widely studied by the global academic community, particularly in Brazil, Argentina and Mexico, which adopted digital government to catch up with developed countries (Lau et al., 2008). India also has shared this approach by allocating a large portion of their budget to digital government development. The aim is to increase access to public services in India and encourage easy and direct government interaction with the community (Sharma et al., 2021). This approach has also been adopted in China, influencing public perceptions of government performance (T. Chen et al., 2023).

Digital government also increases transparency and accountability. Public information can be easily accessed and shared via websites or digital government platforms. The provision of digital government allows the public to monitor and supervise government activities and provide feedback or complaints directly (Abdou, 2021; Baharuddin et al., 2022; Castro & Lopes, 2022). This process reduces corrupt practices and improves the integrity of government. Digital government also enables faster and more responsive adoption of policies and decisions. By leveraging data and analytics, governments can monitor people's needs in real time, identify pressing trends or problems and respond quickly. The government can thus provide more effective and relevant solutions to community needs (Apriliyanti et al., 2021; Pérez-Morote et al., 2020).

The potential offered by digital government is also being adopted in Indonesia (Ibrahim et al., 2023), for instance, in Central Sulawesi. However, the area still requires optimisation in the future. The results of the *Sistem Pemerintahan Berbasis Electronik* (SPBE; Electronic Based Government System) in 2022 show that the average SPBE index was identified at 1.74% (Pemerintah Provinsi, 2023). This SPBE index result prompted the authors to choose a case study in Central Sulawesi. This study explores digital government's potential that currently exists or has not yet emerged as well as maps out some of the challenges faced in adopting and optimising the implementation of digital government. Central Sulawesi was also chosen for study because it is considered accommodating and representative of efforts to develop digital government for the future. The current Central Sulawesi government continues to be active in socialising development and improvement. The province was also selected for case study analysis

as Central Sulawesi Province has developed the necessary telecommunications infrastructure and internet access.

Digital government also facilitates wider public participation in decision-making processes. The government can involve the public by collecting input, opinions or suggestions from various stakeholders on online platforms. Public access allows for more inclusive and democratic public policies (Guenduez et al., 2020; Mansoor, 2021). Overall, digital government provides vital speed when facing the challenges and opportunities of modern society. The government can provide better, transparent, responsive and participatory services to the community by utilising information and communication technology.

However, in some cases, general problems in digital governance remain, particularly in countries of the Global South. The empirical picture of this issue is mapped in Figure 1.
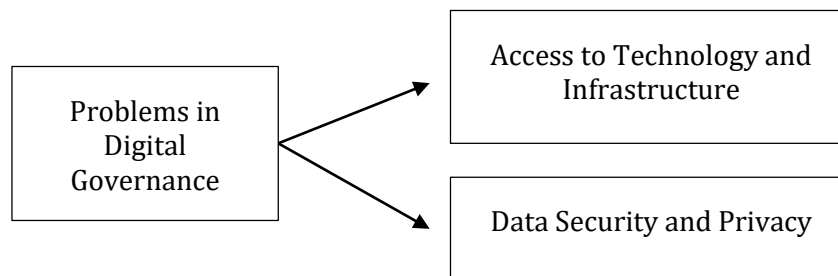

Figure 1. Empirical Findings on Digital Governance Issues in Global South Countries
Source: Processed by Authors (2023)

Common issues in digital governance, prominent in Global South countries, include challenges in access to technology and infrastructure as well as data security and privacy issues. Lack of investment in digital infrastructure and limited internet access have become major obstacles for local governments in providing public services effectively through digital platforms. As highlighted by previous research, concrete examples of this problem can be found in several African countries, where limited internet access and digital infrastructure have hampered the implementation of e government services at the local level (Kariuki et al., 2019; Mutula, 2008). This phenomenon of limited technological infrastructure occurs as a result of other regional socioeconomic problems. In another example, a lack of digital skills among local government officials in Pakistan also makes it difficult to use digital technologies to increase transparency and efficiency in public services (Chohan & Hu, 2022).

Data security and privacy issues are also essential concerns for digital governance in Global South countries. Uncertainty in cybersecurity settings increases the risk of data leaks and cyberattacks, creating new challenges for governments in building public trust in digital government services, as occurred in Thailand and Myanmar (Chang & Coppel, 2020; Thompson et al., 2020). In addition, a lack of solid regulations regarding personal data protection at the local level raises concerns about people's data privacy, as observed

in the cases of India and Indonesia (Anand et al., 2018; Harakan et al., 2024). Thus, Global South countries face similar challenges in addressing these issues in the context of digital governance at the local level.

Although a significant amount of research has been conducted on digital government, only a few studies specifically discuss the potential and challenges of developing digital government locally. In the context of digital government development at the local level, significant potential exists to improve the quality of public services, increase transparency and strengthen community involvement in decision-making processes (Yen, 2020; Zhao et al., 2022). However, some of the challenges identified previously require serious attention from the government (Anand et al., 2018; Bhuiyan, 2011; Kariuki et al., 2019; Mutula, 2008; Wescott, 2001); (Lee-Geiller & Lee, 2019; Zenner, 2021).

Thus, in a period of increasingly diverse demands of modern society, the study of digital government encourages efforts to integrate information and communication technology that invites transparency, efficiency and responsiveness, particularly in the context of public services. However, research gaps remain, especially concerning the development of digital government at the local level. This study therefore aims to present the state of the art by assessing and discussing aspects of digital government development at the local level, including accommodating the potential and challenges faced. This analysis is useful for understanding the complexities of digital government development at the local level with a new perspective.

This study further bridges the gap in previous research by focusing on the potential and challenges of developing digital government locally. This research may provide valuable insights into optimising implementation and overcoming existing barriers to digital government. This case study has selected the Central Sulawesi Province regional government. The province has developed the telecommunications infrastructure and internet access needed after natural disasters, providing opportunities for the development of digital government in the area. The research questions for this study are outlined as follows. (1) What is the level of technological and infrastructure readiness of the Central Sulawesi Provincial Government in implementing digital government? (2) What are the potential and challenges for developing a digital government in Central Sulawesi Province? (3) What are the recommendations for adaptive policies to support digital adaptation in local government?

Research Methods

This research relies on online research methods (ORMs) to collect data via the internet and other digital technologies. ORMs are inherently connected to the internet (Harricharan & Bhopal, 2014). Although some academics doubt the reliability of this approach as a methodological reference, ORMs have significant advantages in collecting information via the internet and digital technology. For example, the main benefit of ORMs is that they allow researchers to collect data quickly and efficiently from various geographic regions and demographic backgrounds. In addition, ORMs can reduce the

costs and time required to conduct research because they do not require fieldwork (Harricharan & Bhopal, 2014).

ORMs play an essential role in providing relevant and representative data in current research, particularly in the context of digital governance at the local level. The ORMs in this study include the data retrieval results from official government websites, such as the government website of Central Sulawesi Province (https://sultengprov.go.id/). The government site was chosen because it is an authoritative information source that displays the latest information. The data collection process involves browsing the website and checking the information to assess its relevance. Afterwards, data collection is conducted. Data retrieval was carried out using the NCapture feature in Google Chrome.

Data successfully obtained are then transferred into an analysis tool, such as NVivo 12 Plus. This approach has been used to assist qualitative research, especially in data coding and visualisation, thereby aiding researchers in analysing the overall data (Alam, 2021). In more detail, some data that has not been visualised on the website in the form of text information is encoded using the NVivo 12 Plus analysis tool. This process maximises available analytical features, such as identifying themes, cases and attribute classifications, as well as theme mapping. Cases and attribute classifications serve to categorise the collected data. Theme mapping is useful for organising the overall results of coding data that have previously been categorised. The coding results are then analysed and described to address the research questions.

This research upholds the validity and reliability of the available data via the chosen ORM approach connecting to the internet on the official government website, which is possible to be checked by external parties. The data collection stage was also carried out with precision, including ensuring the relevance of the available data. Validity and reliability were supported using NVivo 12 Plus as an analytical tool employing a systematic coding process to recognise and map themes, cases and attribute classifications. This stage ensures that a consistent data interpretation can be relied upon to answer the research questions.

Results and Discussion

This section discusses several topics, including technological and infrastructure readiness for implementing digital government in Central Sulawesi. Moreover, the potential and challenges identified in the development of digital government are also examined. This discussion will also present adaptive policy recommendations to support digital adaptation in local government.

Readiness for Digital Government in Central Sulawesi

The level of technological and infrastructure readiness in implementing digital government depends on several aspects. These factors include telecommunications infrastructure, availability of human resources, data centres, government information systems and the availability of applications and platforms. As seen in Figure 2, these elements are essential in determining the extent to which local governments are ready to

adopt digital government (Ariana et al., 2020; Connolly et al., 2010; Dahiya & Mathew, 2016; Lv et al., 2018).
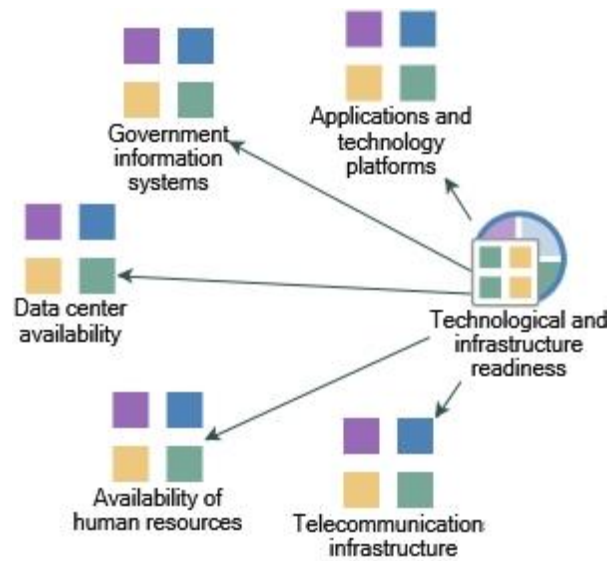

Figure 2. Technology and Infrastructure Readiness for Digital Government
Source: Processed by Authors Using Nvivo 12 Plus (2023)

The technological and infrastructure readiness level in implementing digital government in Central Sulawesi Province plays a vital role in encouraging progress and efficiency in regional government administration. In this context, evaluating the telecommunications infrastructure in Central Sulawesi is crucial. It is essential to assess the availability of telecommunications networks covering all province areas, including rural areas, to ensure stable and fast internet access for the entire community. This assessment becomes relevant in overcoming the geographical challenges of Central Sulawesi, which consists of islands and mountainous areas.

With increased internet accessibility, local governments can expand the use of digital government services, accelerate the exchange of information and effectively improve the quality of public services (Chohan & Hu, 2022; Kopackova et al., 2022; Weerakkody et al., 2013). Developing telecommunications infrastructure, such as fibre-optic networks and base transceiver station towers, is essential to ensure stable and fast internet accessibility throughout Central Sulawesi Province. Through collaboration with Telkom Infra, local governments have been utilising the expertise and resources of leading telecommunications companies to build the required infrastructure (Ridwan & Masrafi, 2022). In addition, a lending system implemented between the regional and the central government provides a framework to ensure the continuity of telecommunications infrastructure services needed in digital government in Central Sulawesi. This collaboration provides a strong basis for building telecommunications infrastructure supporting the development of successful digital government in the region.

Furthermore, the availability of human resources with skills and technological knowledge is vital for the development of digital government (Porwol et al., 2016; Sabani, 2020). An evaluation of the level of understanding and skills of human resources in local governments and related agencies needs to be conducted. In the context of Central Sulawesi, efforts to increase human resource competency in information technology involve collaboration and training to develop employee understanding and skills for operating the technology needed to support digital government. However, this training must be executed optimally and sustainably to encourage local governments to continue to maximise the potential of their resources to be able to adapt to technological advances.

In addition, a secure and well-managed data centre is an important aspect of developing digital government (Long et al., 2022; van Zoonen, 2020). Data centres aim to provide a safe and reliable infrastructure for efficient data storage, processing, and management (Alhebaishi et al., 2017). Studies such as Höchtl et al. (Höchtl et al., 2016) have shown that data centres are positively correlated with the quality of public services. Data centres have several main purposes in digital government development, principally for storing and managing data centrally (Zwattendorfer et al., 2013). Central Sulawesi Province must invest in data centre infrastructure to meet the government's data storage and processing needs. Proper data management will ensure the security and integrity of government information and support efficiency in decision-making and the provision of public services.

Government information systems are also a significant part of the development of digital government (Y. C. Chen et al., 2019; Smith & Jamieson, 2006). These information systems provide a framework and infrastructure enabling the collection, processing, storage and exchange of information between various government units and agencies (Alhebaishi et al., 2017; Y. C. Chen et al., 2019; Smith & Jamieson, 2006). Moreover, government information systems are designed to increase the efficiency and effectiveness of government administration processes (Ismagilova et al., 2019; Moynihan & Pandey, 2010; Rifaid et al., 2023). By automating several routine tasks and standardising work processes, government information systems can reduce human error, speed up information flow and optimise resource use. These benefits improve the quality of public services, offer faster response times and allow better decision-making (Abdulkareem & Mohd Ramli, 2022; Cohen et al., 2019; Diegtiar et al., 2023). It is necessary to analyse how digital systems for personnel administration, finance, planning and public services are integrated and can support transparency, accountability and efficiency in regional government operations (Hariguna et al., 2021; Malodia et al., 2021). Identifying weaknesses in existing information systems can be the basis for improving the integration and interoperability of these systems.

Finally, the availability of applications and technology platforms that suit the needs of local governments and the community is a crucial factor in developing digital government. It is essential to have available e government applications, public portals and document management systems that facilitate access and interaction between local governments and the community (Contreras-Espinosa & Blanco-M, 2022; Cordella & Paletti, 2019; Purwanto et al., 2020). Regional governments can collaborate with local or

national technology developers to provide solutions that meet regional needs. Technology applications and platforms enable the government to provide public services digitally, making it easier and faster for the public to access government services (Cordella & Paletti, 2019; Purwanto et al., 2020). With mobile devices or online platforms, people can submit applications, pay taxes, access information or interact with the government practically and flexibly.

The government platform that is maximised to provide digital government in Central Sulawesi Province is the official government website. Although the provincial government website contains several public services, the authors of this study maintain that the services offered still must be optimised. An overview of these services can be seen in Figure 3.
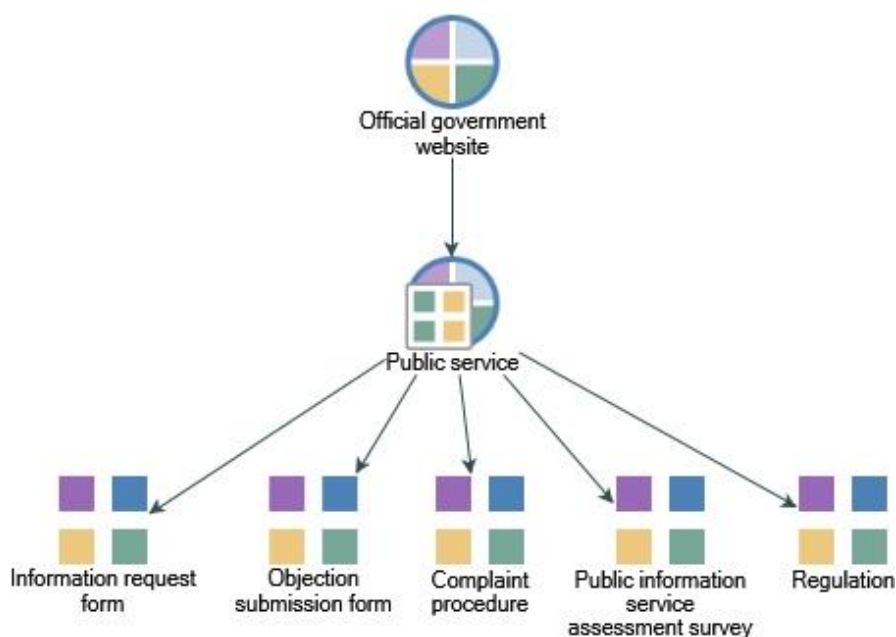

Figure 3. Maximised Websites and Services in Central Sulawesi
Source: Processed by Authors Using Nvivo 12 Plus (2023)

The Central Sulawesi Provincial Government is maximising the website platform to provide public services. These services include information request forms, objection submission forms, complaint procedures, public information service assessment surveys and regulations (Local government in Central Sulawesi, 2023). In the analysis carried out, it was found that although the Central Sulawesi Provincial Government has provided services through a website platform, the services offered tend to be less substantial in supporting public service needs. Although the services mentioned are vital in providing transparent and accountable public services, emphasis on administrative aspects and data management without paying attention to the substance of the service itself can result in dissatisfaction and incompetence in fulfilling the public interest.

To increase the effectiveness of public services through website platforms, it is necessary to have a deeper understanding of people's needs and focus on substantial

aspects that can provide direct benefits (Ansell et al., 2021; Sun & Medaglia, 2019; Torfing et al., 2019). Apart from providing application forms and complaint procedures, considering the continuity of follow-up to applications, resolution of complaints and implementation of regulations relevant to people's daily lives is essential. In developing public services, active participation is needed from the community to involve them in the decision-making process that affects their lives. In particular, the community should be involved in formulating policy, selecting priority services and evaluating the quality and sustainability of the services provided (van Zoonen, 2020). This participation will ensure that public services provided through the website platform can substantially accommodate public interests and provide real benefits for the people of Central Sulawesi.

Potential and Challenges of Developing Digital Government in Central Sulawesi

As described above, digital government involves the use of information and communication technology to increase efficiency, transparency, citizen participation and the quality of public services (Aminah et al., 2018; Y. C. Chen & Kim, 2019; Jacob et al., 2019). The development of digital government is an increasingly important effort for regions in Indonesia, including Central Sulawesi Province, which has potential and barriers that must be considered in developing a digital government. Figure 4 outlines the opportunities and challenges in developing a digital government in Central Sulawesi Province.
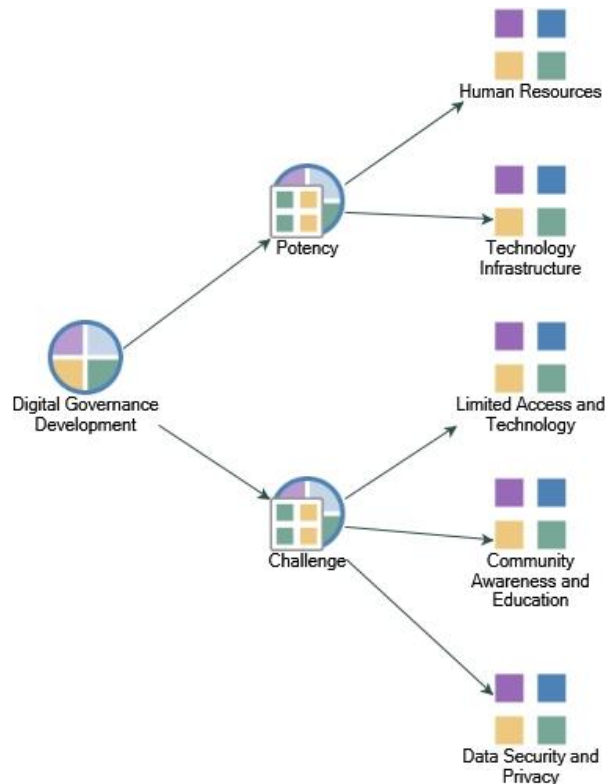

Figure 4. Potential and Challenges in Developing Digital Government
Source: Processed by Authors Using Nvivo 12 Plus (2023)

Although the development of digital government in Central Sulawesi Province has significant potential to improve the efficiency and quality of public services, challenges remain. One of the principal hurdles is limited access and technology in several Central Sulawesi areas, which hinders digital service distribution. In addition, public awareness and understanding of the benefits and how to use digital government services must be increased through education and outreach programmes. Data security and privacy are also critical issues that must be addressed with strict policies. Through efforts to improve technological infrastructure, training, education and effective outreach, the Central Sulawesi Provincial Government can overcome these challenges and exploit the potential of digital government. In this way, the people of Central Sulawesi can enjoy public services that are more effective, transparent and responsive to their needs.

Apart from the challenges mentioned previously, the development of digital government in Central Sulawesi Province also faces several other restrictions, such as a limited budget for developing technological infrastructure and implementing more sophisticated information systems. The government requires a sufficient budget allocation to meet these needs. In addition, the adoption of new technology can also cause resistance and discomfort among government employees who have yet to become accustomed to these changes. Intensive training and mentoring are needed to ensure government employees can adapt smoothly and utilise existing technology.

Another challenge is the importance of building public trust regarding the security and privacy of data collected in digital government (Agozie & Kaya, 2021; Khan et al., 2021; Li & Xue, 2021). Governments must adopt strong privacy policies, maintain the confidentiality of data provided by the public and ensure that data is used ethically and only for lawful purposes (Manoharan & Carrizales, 2021; Thompson et al., 2020). In addition, Central Sulawesi, which has cultural and linguistic diversity, must face the challenges of multiculturalism and multilingualism in developing digital government. The government should consider this aspect in designing and providing digital services so they can be accessed and utilised by various groups in society. By recognising these challenges and taking appropriate strategic steps, the Central Sulawesi Provincial Government can overcome obstacles in the development of digital government, thereby achieving great improvements in the efficiency and quality of public services and strengthening community participation in the decision-making processes.

Adaptive Policy Recommendations to Support Digital Adaptation in Local Governments

Adaptive policies are needed to support digital adaptation in local government to overcome challenges and take advantage of opportunities in the digital era. Adequate digital infrastructure is the main foundation for this transformation. Local governments must allocate resources to build infrastructure, including fast and stable internet networks, secure data centres and the hardware and software needed to support digital transformation. However, this policy must adapt to changing technological developments because digital infrastructure needs will continue developing along with technological innovation. This technological adaptation has been considered in various cases in many

countries, including China, India, Brazil and Malaysia (T. Chen et al., 2023; Lau et al., 2008; Ramli, 2017; Sharma et al., 2021).

In addition, investments in training and human resource development are necessary elements of adaptive policy. Local governments should provide comprehensive training programmes for government employees in information and communications technology (Nurdin & Baharuddin, 2023). Training covering the use of special software and applications and aspects of digital security and data management will improve the digital skills needed to utilise technology more effectively (Chohan & Hu, 2022). In this case, adaptive policies must identify new and relevant training needs with the latest technological developments and update training programmes regularly.

Local governments must also consider accessibility aspects in their adaptive policies., ensuring digital services provided by the government are easily accessible to all citizens, including those who may have physical limitations or little access to technology (Malodia et al., 2021). Therefore, the user interface design must be optimised to be easy to operate for all users, including those with special needs (Sterrenberg & L'Espoir Decosta, 2023). In addition, local governments must provide technical support for citizens who need help accessing and using digital services. An inclusive approach must be adopted in designing and developing digital services so that all citizens can benefit from the digital transformation.

Security and data protection must also be a principal concern in adaptive policies. In adopting digital technology, local governments must prioritise the security and privacy of citizen data. Policies and procedures governing data management and protection must be strictly implemented. In addition, local governments must comply with relevant security standards and continuously monitor developments in information technology security. Education and digital security awareness are also crucial skills for government employees and citizens to recognise risks and take appropriate precautions (Rifaid et al., 2023; Thompson et al., 2020; Yang et al., 2019).

Collaboration and partnerships are key factors for local governments to successfully transition to digital government. Local governments must collaborate with the private sector, academic institutions and civil society to develop innovative digital solutions. By working together, local governments can leverage expertise and resources outside their organisations and speed up innovation. Adaptive policies should encourage cross-sector collaboration and facilitate forming sustainable partnerships for developing and implementing digital solutions (Pilemalm et al., 2016).

Additionally, policies to support digital adaptation in local government must be equipped with effective monitoring and evaluation mechanisms. Local governments must continuously monitor the implementation of their digital initiatives and evaluate their impact and effectiveness. Regular monitoring and evaluation can identify emerging problems and suggest necessary corrective action. moreover, data collection and feedback from citizens must be an integral part of the monitoring and evaluation process so that local governments can understand the needs and expectations of citizens regarding the digital services provided. In addition to monitoring and evaluation, policies

supporting digital adaptation in local government must consider digital infrastructure, human resource training, accessibility, data security, collaboration and partnerships.

The government must continue to improve the quality and coverage of technological infrastructure throughout the Central Sulawesi region. This improvement can be accomplished through collaboration with telecommunications and internet service providers and developing technology-based government initiatives such as building data centres and high-speed internet networks. The government also should implement training and education programmes related to digital government for government employees and the public. These programmes can increase public understanding, skills and awareness about the use of technology in public services. In addition, data protection and privacy must be a priority in developing digital government. The government must implement strict security policies and standards to protect user data. Law enforcement against data and privacy violations must also be improved.

Conclusion

The potential for developing a digital government locally in Central Sulawesi is considerable. As one of Indonesia's provinces with a variety of natural and human resources, Central Sulawesi's implementation of digital technology can provide significant benefits increasing the efficiency and effectiveness of public services. By adopting appropriate information and communication technology, the Central Sulawesi regional government can optimise data management, speed up administrative processes and increase citizen involvement in decision-making. Moreover, the potential growth of the technology sector in Central Sulawesi offers new economic opportunities in the software industry, information technology services and other digital innovations. However, the development of digital government at the local level also faces challenges that must be overcome, such as limited access to digital infrastructure, few digital skills among government employees and the technology gap between urban and rural areas. Therefore, strong commitment from local governments and coordination between various stakeholders is needed to overcome these challenges and optimally utilise the potential for digital government development.

In the context of Central Sulawesi, the development of digital government at the local level may face unique challenges. For example, diverse geographical conditions are an issue, with scattered urban and rural areas. Limited digital infrastructure in rural areas can be an obstacle to evenly implementing digital solutions. Therefore, special efforts are needed to expand the reach of internet access and strengthen connectivity throughout the Central Sulawesi region. Additionally, improving digital skills among government employees is needed. Comprehensive and ongoing training programmes should be introduced to improve government employees' digital literacy and technology skills. Active citizen participation in the development of digital government should be increased through education and participatory initiatives. By overcoming challenges and exploiting existing potential, Central Sulawesi can develop digital government to drive significant

transformation in the delivery of public services and sustainable development in the region.

The implications of these findings can be a lesson for many regions of Indonesia. The implementation of digital government should not only be seen as a potential opportunity – a comprehensive understanding is needed of challenges that may arise. By disentangling these issues, local governments in Indonesia can plan and conduct comprehensive pre-evaluations. This effort will bridge the potential for digital government development in the context of good governance and encourage proactive public participation. The adaptive policy recommendations outlined previously should be considered and evaluated in the future so that optimising the implementation of digital government becomes more valuable and inclusive.

Acknowledgement

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